ASSOCIATION OF

FEDERAL COMMUNICATIONS CONSULTING ENGINEERS

WASHINGTON, D.C.

October 20, 1998

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
Mass Media Services
1919 M Street N.W.
Room 222
Washington, DC 20554

Dear Ms. Salas:

Transmitted on behalf of the Association of Federal Communications Consulting Engineers ("AFCCE") is an original and 14 copies of Comments to be associated with MM Docket No. 98-93, in the matter of *1998 Biennial Regulatory Review - Streamlining of Radio Technical Rules in Parts 73 and 74 of the Commission's Rules.*

If any questions should arise concerning this matter, please communicate with the undersigned.

Sincerely,

Cynthia M. Jacobson
President, AFCCE

Enclosures

cc: w/enc.
Chairman William E. Kennard
Commissioner Susan Ness
Commissioner Harold Furchtgott-Roth
Commissioner Michael Powell
Commissioner Gloria Tristani

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC

In the Matter of	)	
1998 Biennial Regulatory Review — Streamlining of Radio Technical Rules in Parts 73 and 74 of the Commission's Rules	)	MM Docket No. 98-93

COMMENTS OF THE ASSOCIATION OF
FEDERAL COMMUNICATIONS CONSULTING ENGINEERS
FCC NOTICE OF PROPOSED RULE MAKING

I. Introduction

A. The Association of Federal Communications Consulting Engineers (AFCCE), celebrating 50 years, is an organization that includes approximately 90 full members, who are Registered Professional Engineers engaged in the practice of consulting engineering before the Federal Communications Commission.

B. AFCCE supports and commends the Commission for its efforts to review and revise its technical Rules and policies related to Radio Broadcasting.

II. Negotiated Interference in the FM Service (NPRM para 3 - 27)

A. Negotiated interference would degrade the FM service. AFCCE discourages the idea of intentionally permitting interference. The Commission has had to work very hard in reducing interference in the congested AM service, which is well known for interference.[1] We believe that the negotiated interference proposal is not in the best interest of the public and the future of the FM service. Nonetheless, in the event the Commission does enact rules permitting negotiated interference, AFCCE offers the following comments on the proposal.

B. The filing of contingent proposals that include one-step upgrades and downgrade applications should be permitted (para 13-16). Allowing stations to pursue coordinated facility changes should not have the threat of competing applications being filed. The Commission has proposed to limit the number of contingent applications to four to a "packet", which appears to be a reasonable number. The

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[1] *Policies to Encourage Interference Reduction Between AM Broadcast Stations*, Report and Order, 5 FCC Rcd 4492 (1990).

"packet" filing should have no additional limits under any of the common ownership considerations.

C. Under the proposal, total interference to an affected station is to be determined. In the determination of which stations contribute to interference (para 20), AFCCE recommends that only those stations which are not fully spaced under §73.207 or §73.213(c) should be considered. Even fully-spaced stations (depending on the intervening terrain) can have contour overlap. Otherwise, the influence of minor modifications of fully-spaced stations could affect interference areas.

D. AFCCE supports the proposal to prohibit the new siting of second and third adjacent stations within the 63 dBμ contour of an NCE station to avoid interference deep within its service area (para 21).

E. In the determination of the interference area, AFCCE supports the use of the ratio method, rather than strict contour overlap (para 23).

III. Point-to-Point Prediction Methodology (para 29 - 30)

A. In this proposal, the Commission is attempting to address one shortcoming in its standard contour prediction method (as described in §73.313) and permit the use of an alternate contour prediction method for interfering contours. The Commission's standard prediction method is administratively easy to apply, and relies on the effective height of the transmitting antenna over the average terrain along a radial to establish signal levels.

The shortcoming, which is well-known, is that terrain features beyond 16 km from the transmitter site are ignored in the determination of contour distances. Interfering contours (such as those required under §73.215 and §73.509) may be predicted to exist at locations well beyond a significant terrain feature, if the terrain blockage exists beyond 16 km away.

AFCCE supports the use of an alternative prediction method for interfering signal level determination. However, we find that the Commission's PTP method (a detailed description of the model is set forth in Appendix B of the NPRM), in an effort to also be administratively easy, should not be utilized, as described in the following.

1. Introduction

To aid in technical review of the proposed methodology, the Commission has made available a report describing the derivation of the PTP model, along with the Fortran routines needed to implement the model. The Commission has provided graphical comparisons of measured signal strength against the values predicted by the FCC method (per §73.684, hereinafter "the FCC Model"), the ITS Irregular Terrain Model ("Longley-Rice"), and the proposed PTP model for numerous different propagation paths.

2. Comparisons

The Commission has made available 262 graphs comparing measured data with predictions made using the FCC Model, the Longley-Rice Model, and the PTP Model. Of these 262 graphs, 185 are for the VHF range and 77 are for the UHF range. Each graph includes the terrain profile for the path shown on the graph. Finally, the graph gives an analysis of the prediction errors relative to each of the three models (FCC, Longley-Rice, and PTP).

The analysis of the prediction errors provided by the Commission includes the mean value and standard deviation of the prediction errors for each model for the measurement points along each graph. For any particular graph and model, the mean value is thus the bias in that model for that graph and the standard deviation is a measure of the goodness of fit of that model for that graph.

The average of the mean values for the graphs would seem to be a reasonable indicator of the general tendency of each model to over-estimate or under-estimate signal strengths, and the average of the standard deviations serves as a measure of the overall deviations of prediction errors about the mean. The averaging results are given in the following table:

AVERAGES OF FCC PREDICTION ERRORS ANALYSIS						
Model	AVG OF THE MEANS (dB)			AVG OF THE STD DEVs (DB)		
	VHF	UHF	Total	VHF	UHF	Total
FCC	-1.0	-6.2	-2.5	7.1	11.2	8.4
L-R	-3.1	-11.1	-5.4	8.5	12.5	9.6
PTP	-5.2	-8.3	-6.1	8.5	15.0	10.4

The first thing to note is that, given no a priori knowledge of the situation, the FCC model gives the best results, that is, the smallest absolute value of the average of the means and the lowest average of the standard deviations. This is a very satisfying result, since this model has been used for years as a basis for practically all of the Commission's decisions involving coverage.

The second thing to note is that the Longley-Rice model has 2.1 dB less average bias than the PTP model in the VHF region but 2.8 dB more average bias in the UHF region. In other words, neither of the two possible alternatives to the FCC model is the better performer throughout the range of frequencies used in the Broadcast industry.

It is suggested that an overall average prediction error of 3.0 dB would be relatively good performance for a signal strength model. Under that criterion, the

performance of the FCC model at VHF is very good, the Longley-Rice model not at all bad, and the PTP model is the least acceptable of the three. At UHF, all three models tend to be overly optimistic. When all 262 graphs are considered, only the FCC model would be rated "good".

With respect to standard deviation, that is, the variability of the differences between predicted and measured values, it is suggested that a standard deviation of about 8.0 or 8.5 dB at VHF and 11.0 or 12.0 dB at UHF indicates good model performance. Again, the FCC model is the best of the three at both VHF and UHF.

3. Obstacle Analysis

The PTP model fails to model paths with multiple obstructions by treating each obstacle individually as does the Longley-Rice and other models. Also, the PTP further fails to adequately characterize the obstruction, but rather uses a "blending" method that considers the knife-edge diffraction losses for the highest obstacle and smooth earth diffraction losses. Thus, a reliable characterization of the actual terrain obstruction is not yielded from the PTP model.

4. Clutter Loss

A clutter loss factor "C" in the PTP model of 5 dB is specified in the PTP model, which "represents the median clutter loss in average suburban areas" (to account for vegetation, man-made structures, etc.). We must emphasize that a median loss factor should not and cannot be universally applied for accurate results. Clutter loss varies widely by location. For example, the expected clutter loss in locations with sparse vegetation such as Arizona will vary widely from that experienced in heavily vegetated and/or urbanized areas. Some capability to vary clutter loss according to the location involved is necessary.

Further, it appears the PTP method uses the clearance ratio to establish a value for clutter losses. Clutter loss should reflect the local environment of the receiving location (i.e.: vegetation, buildings, etc.), rather than clearance of terrain obstructions along the path (which may be a considerable distance from the receiver). The PTP method does not derive clutter losses in an expected manner.

5. Conclusion and Recommendation

Based on comparisons of the performance of the proposed PTP signal strength prediction model with that of the existing FCC model and the widely-recognized Longley-Rice model for a very large collection of measurement data, it is clear that the PTP model performs poorly relative to both of the other models. Its performance is particularly deficient when compared with the FCC model. The obstacle analysis is compromised, as multiple obstructions are treated as a single obstruction. Further, the nature of the selection of clutter loss and the inability to vary clutter loss also handicaps the PTP method.

It is strongly urged that there be no further consideration of the proposed PTP model as an alternative to the existing FCC model.

B. AFCCE encourages the Commission to permit the use of alternate prediction methods to show, on a case-by-case basis, that an interfering signal does not extend as far as that predicted by the standard prediction method. In such cases, the intervening terrain is atypical, and an administratively easy method (such as the PTP method as proposed) cannot be accurate in each case. For these cases, technical judgement is warranted in the application of non-standard propagation given the particulars of the situation. If the Commission does not have the resources to evaluate individual showings, then it is better to leave the current rules in place than to allow yet another prediction model that will lead to additional controversy.

IV. Commercial FM Technical Requirements

A. AFCCE supports the Commission's proposal to reduce the minimum distance separation requirements of §73.215(e) to a minimum of 6 km relief over §73.207 (para 36). While co and first-adjacent stations were granted relief in the establishment of §73.215(e), second and third-adjacent stations had little to gain. In some cases, no relief was granted to second and third-adjacent stations; the use of a directional antenna or reduced power operation is not an option for these stations. Revision of the §73.215(e) spacing table to afford all FM stations a minimum of 6 kilometers from §73.207 is supported. AFCCE recommends that the contour protection as defined under §73.215(a) must still be adhered to. Some cases of a 6 kilometer short-spacing may result in the proposal's site lying within the protected contour of the short-spaced station - in these cases, the full 6 kilometers would not be available.

V. New Class C Height Above Average Terrain Requirements

A. AFCCE agrees that the establishment of a Class C0 at 100 kW ERP/450 meters HAAT would create a far more efficient use of the FM spectrum (para 40 - 44). For existing Class C stations authorized with less than 450 meters HAAT, the achievement of 450 meters HAAT is in many instances not technically practical (i.e., in areas such as Florida) or is not cost feasible. Amending the FM minimum distance separation tables for the new station class would permit possible upgrades or facility relocations for stations long prohibited from doing so because of overprotection. Loss of a primary service area for reclassified Class C0 stations would be a moot point, since these stations in reality never served these areas. Creation of a buffer zone would be appropriate in order to enable present Class C stations the opportunity in which to locate a site that could exceed a minimum HAAT of 450 meters. A buffer zone of approximately 9 kilometers would be the difference in the 60 dBμ coverage of a maximum Class C and Class C0 facility.

VI. Streamlined Application Processing Changes

A. AFCCE concurs that "First Come/First Served" processing should be extended to minor changes for AM, reserved FM band and FM translator stations (para 46 -47). Enhancement of a current facility, without the threat of conflicting applications, promotes once again a fair and equitable use of the radio spectrum. Unnecessary delays are costly for the applicant and an inefficient use of the Commission's processing staff.

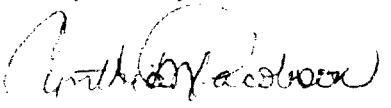
B. AFCCE supports the Commission's proposal to permit coordinate corrections up to 3 seconds latitude and 3 seconds longitude with a single license application (para 51 - 52). A correction of 3 seconds latitude and 3 seconds longitude would typically result in a site difference of approximately 0.12 kilometers. A single application to correct coordinates should be permitted only for licensed facilities, not outstanding, unconstructed facilities. In the event a licensed facility would become short-spaced under §73.207, §73.213, or §73.215(e) (where such short-spacing does not currently exist), AFCCE recommends that the Commission require the request to be made on FCC Form 301 (or Form 340) and be accompanied with an exhibit addressing the short-spacing(s).

VII. Relaxed Noncommercial Educational FM and Translator Technical Requirements

A. NCE FM and FM Translator stations should be permitted to apply the 100 dBu interfering contour with respect to stations operating on second-adjacent frequencies, as this less restrictive requirement applies to commercial channels (para 55 - 56).

B. NCE-FM stations should be required to provide 60 dBu service to at least a portion of their community of license (para 57 - 58). Requiring such a level of service is a public interest issue. Those existing NCE-FM's not providing 60 dBu coverage should be "grandfathered" until such time a modification of facility is filed, in which case signal levels over the principal community should not be decreased.

Respectfully Submitted,



Cynthia M. Jacobson
President
October 20, 1998